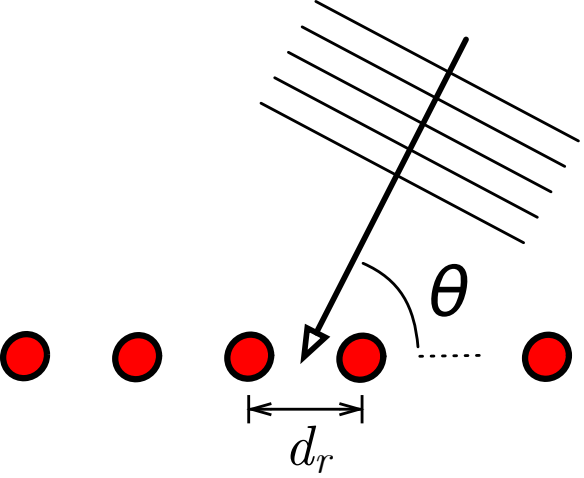
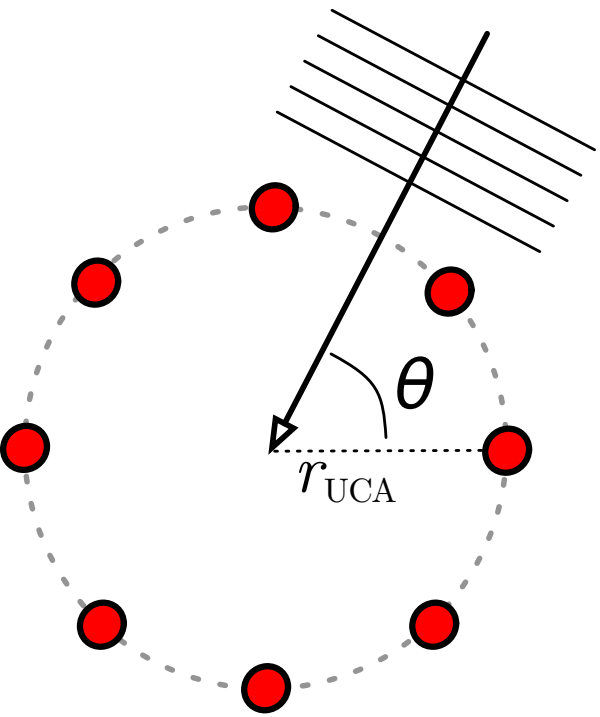


ULA

$$\phi_i(\theta) = 2\pi \frac{i d_r \cos(\theta)}{\lambda_c} \quad i = 0, \ldots, N-1$$



UCA

$$\phi_i(\theta) = 2\pi \frac{r_{\mathrm{UCA}} \cos\left(\theta - \theta_i\right)}{\lambda_{\mathrm{c}}} \quad i = 0, \ldots, N-1$$

θ_i is the angle subtended by the ith antenna element